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**JP2580661B (granted patent related to JP-01-172315 (Application nos 62-330684 / JP19870330684)**

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

Field of the Invention This invention relates to the high constituent for the mouths of the chemical-cleaning effect.

Problem which a Prior art and an invention tend to solve Removing the dirt of gear teeth, such as a stain which adhered to the tooth and deposited, a plaque, and tar of the cigarette eaten and lent, by the mechanical work of the abrasive soap blended with constituents for the mouths, such as toothbrushing, is performed conventionally. However, a tooth flank is deleted, and it becomes easy to damage this mechanical cleaning method, and it has the danger of wearing a tooth out, so that the grinding force of abrasive soap becomes high. On the contrary, if grinding force is lowered in order to avoid damage to a tooth, it has the problem that cleaning power will also decline. When [ which adhered to the tooth and deposited ] eating and lending etc. polishes a tooth flank with a toothbrush, it is removed, but the portion which a toothbrush does not reach also has the problem that it cannot clean.

For this reason, the following proposals are made as what does not only twist the dirt of a tooth to a mechanical work, but is removed by a chemical operation.

\*\* The constituent for the mouths which blended specific organic peroxide (U.S. Pat. No. 3,988,433).

\*\* The constituent for the mouths which used together a cationic surface active agent and malic acid (U.S. Pat. No. 4,183,916).

\*\* The constituent for the mouths which blended the ester which has an aromatic ring (JP,48-43869,B).

\*\* The constituent for the mouths which blended the chelating agent with the stability constant of  $\text{Fe} > \text{Ca}$  (JP,51-139639,A).

\*\* The constituent for the mouths which used together polyphosphate salt and a polyvalent metal positive ion (JP,52-108029,A).

These people made the following proposals as a constituent for the mouths from which the dirt by tar of a cigarette, etc. are removed chemically previously.

\*\* The constituent for the mouths which used phytic acid and organic acid together (JP,56-18911,A).

\*\* The constituent for the mouths which blended tartaric acid, glyceric acid, hydroxy-n-butyric acid, and dihydroxymalonic acid (JP,60-4117,A).

\*\* The constituent for the mouths which used together carvone, anethole or 3-octanol, and the solvent extraction thing of the Astragalus vegetation (JP,61-286315,A).

\*\* The constituent for the mouths which blended 2-octanol (JP,62-151498,A).

\*\* The constituent for the mouths which blended specific monoterpene (JP,62-181212,A).

\*\* The constituent for the mouths which blended fatty acid ester with 7-11 total carbon (Japanese Patent Application No. No. 189233 [ 62 to ])). However, a high constituent for the mouths of the chemical-cleaning effect is desired. The means and operation for solving a problem This invention persons, In order to attain the above-mentioned purpose, as a result of advancing examination further wholeheartedly, 2-octanone, 2-nonanone, 2-decanone, 2-methyl-4-heptanone, 1,2-epoxy octane, Styrene oxide, 1,2-epoxy-2-phenylpropane, a 1,2-epoxy decane, The operation which removes the dirt of teeth, such as tar of a cigarette, chemically is high, pinene epoxide and 1,2-epoxy-d-limonene carry out the knowledge of making possible the constituent for the mouths excellent in the chemical-cleaning effect, and it comes to make this invention.

This invention Therefore, 2-octanone, 2-nonanone, 2-decanone, 2-methyl-4-heptanone, The constituent for the mouths which blended one sort chosen from 1,2-epoxy octane, styrene oxide, 1,2-epoxy-2-phenylpropane, a 1,2-epoxy decane, pinene epoxide, and 1,2-epoxy-d-limonene or two sorts or more is provided.

Here this invention 2-octanone, 2-nonanone, 2-decanone, The chain ketone compound chosen from 2-methyl-4-heptane, 1,2-epoxy octane, One sort of the epoxy compound chosen from styrene oxide, 1,2-epoxy-2-phenylpropane, a 1,2-epoxy decane, pinene epoxide, and 1,2-epoxy-d-limonene or two sorts or more are used.

As for especially the loadings of 0.01 to 10% of the whole constituent, and an epoxy compound, although it is preferred to use 0.01 to 20% of the whole constituent (it is below the same% of the weight) as for the loadings of a ketone compound and an epoxy compound, it is preferred for the loadings of a ketone compound to consider it as 0.01 to 20%.

Although the constituent for the mouths of this invention is prepared as toothbrushing, such as tooth paste, mouth wash, troches, and chewing gum and it is applied, as other ingredients of this invention, the proper ingredient according to the kind of constituent for the mouths is used in this case. For example, if it is cases, such as practice, abrasive soap, a binder, a viscous agent, a surface-active agent, a sweetening agent, an antiseptic, various active principles, etc. can be mixed with water, and it can manufacture in accordance with a conventional method.

In this case, it is preferred that the pH of an abrasive soap water dispersion uses the almost neutral abrasive soap which is 6-9 10% as abrasive soap. For example, one sort chosen from neutral silica system abrasive soap, calcium pyrophosphate, calcium hydrogen phosphate, and 2 hydrate, calcium hydrogen phosphate and anhydrate, neutralization treatment aluminium hydroxide, etc. or two sorts or more are used suitably. The pH of a 10% water dispersion is smaller than six, or when a larger thing than 9 is used, a chemical dirt removing effect may be reduced.

EFFECT OF THE INVENTION When the constituent for the mouths concerning this invention blended one sort chosen from 2-octanone, 2-nonanone, 2-decanone, 2-methyl-4-heptanone, 1,2-epoxy octane, styrene oxide, 1,2-epoxy-2-phenylpropane, a 1,2-epoxy decane, pinene epoxide, and 1,2-epoxy-d-limonene, or two sorts or more, the dirt of teeth, such as tar etc. of a stain, a plaque, and the cigarette eaten and lent, can be effectively removed by a chemical operation, cleaning of the portion which a brush does not reach is also possible and the whitening effect of a tooth flank increases. Since the cleaning effect by the above-mentioned chain ketone compound or an epoxy compound is high, when preparing toothbrushing, the loadings of abrasive soap can be reduced, and wear by the abrasive soap of a tooth can also be reduced.

Next, the example of an experiment is shown and the effect of this invention is

explained concretely.

[Example 1]

The constituent of the following formula which blended ketone or the epoxy compound shown in the 1st and 2 table was prepared, and the cleaning power was evaluated in accordance with the following method.

Ketone or an epoxy compound 1-% of the weight sodium-lauryl-sulfate 1 water 98 meter 100.0-% of the weight cleaning power appraisal method given in formula the 1st and 2 table Cigarette tar is collected by the usual method and is uniformly applied on the tile of 13.5 mm squares. After carrying out stoving of this at about 130-140 °C one whole day and night, it set to the polishing vessel, and brushed in 200 g of load using the sample (15 ml), and image processing estimated the extraction ratio of cigarette tar of an after-polish tile.

Since the number of times of brushing changed with lots of tar, respectively, the extraction ratio of tar of l-carvone (it is [ the water dispersion of 1% of 1%+ sodium lauryl sulfate and the following ] the same) which is an internal standard set it as the number of times of polish used as about 6 each time. 6.0 and peppermint oil were set to 2.4, water was made into the standard of 0 for l-carvone, and evaluation of the sample prepared and computed the analytical curve from the experimental value and reference value of these internal standards.

As a brush of brushing, it is nylon (62%) construction material the thickness (per bundle) of 8 mils (about 0.2 mm) of the number of hair-bundles, and 44 hair, and 12 mm [ woolen ] in length, and the hardness of construction material used the thing of M by the home article descriptive label method.

The following standard estimated cleaning power from the acquired cigarette tar extraction ratio.

Valuation-basis marks 1: Cigarette tar extraction ratio Tar hardly falls 0 to 10%.

2: \*\* 10-20 It seldom falls.

3: \*\* 20-30 \*\* 4: \*\* 30-40 It falls a little.

5: \*\* 40-50 \*\* 6: \*\* 50-60 It falls considerably.

7: \*\* 60-70 \*\* 8: \*\* 70-80 It almost falls.

9: \*\* 80-90 \*\* 10: \*\* 90-100 It falls thoroughly.

A result is shown in the 1st and 2 table.

第 1 表

ケトン	全炭素数	溶解力	
シクロペンタノン	5	1.1	比較例
2-ヘキサノン	6	1.4	〃
2-ヘプタノン	7	2.1	〃
シクロオクタノン	8	0.6	〃
2-オクタノン	8	6.7	本発明例
2-ノナノン	9	7.3	〃
2-デカノン	10	6.8	〃
ジヒドロカルボン	10	3.6	比較例
8-ジヒドロカルボメ ントン	10	0.6	〃
6-ヒドロキシカルボ ン	10	0.5	比較例
1-メントン	10	4.6	比較例
2-ウンデカノン	11	3.1	〃
4-ドデカノン	12	1.3	〃

第 2 表

エポキシ化合物	全炭素数	清掃力	
1,2-エポキシブタン	4	1,3	比較例
シクロヘキセンオキサイド	6	2,1	〃
1,2-エポキシヘプタン	7	3,8	比較例
1,2-エポキシオクタン	8	6,8	本発明例
ステレンオキサイド	8	7,2	本発明例
1,2-エポキシ-2-フェニルプロパン	9	7,3	〃
1,2-エポキシデカン	10	6,2	本発明例
ビネンエポキシサイド	10	6,1	〃
1,2-エポキシドデカリン	10	6,9	〃
1,2-エポキシドデカリン	12	2,1	比較例
1,2-エポキシテトラデカン	14	2,2	比較例

The knowledge of a chain ketone compound with the 8-10 above-mentioned total carbon and an epoxy compound with 8-10 total carbon having a high effect specifically in cleaning of tar of a cigarette is carried out from the result of the 1st and 2 table.

[Example 2]

The tooth paste of the formula shown in the 3rd table was prepared, and the stain adhesion inhibition effect was investigated in accordance with the following method by four panels.

Test method Four general healthy persons (a male, a smoker) were chosen, and the use test was done one month after scaling using toothbrushing (No.1 and No.2: this invention toothbrushing, No.3: comparison toothbrushing) shown in the 3rd table, respectively. Especially the amount of toothbrushing was performed without teaching by the method of the length of a toothbrush usual [ about 2/3 ] in brushing. A total of 3 times photography immediately after scaling and after two weeks of test starts and four weeks of test starts was performed, and the following method estimated the adhesion degree of the stain.

Valuation method of a stain It covers on the photograph which photoed the transparent plastic film describing the lattice whose interval is 3.5 mm, the grid to which dirt has adhered is counted, and it is the marks and \*\* of a stain. The evaluation part was evaluated using a total of the up-and-down gnathochilarium side of 3-3, and 12 gear teeth.

A result is shown in the 4th table.

第 3 表

	本発明歯磨 剤No. 1	本発明歯磨 剤No. 2	比較歯磨 剤No. 3
コロイド状シリカ	10%	10%	10%
酸化チタン	0.5	0.5	0.5
プロピレングリコール	3.5	3.5	3.5

	本発明歯磨 剤No. 1	本発明歯磨 剤No. 2	比較歯磨 剤No. 3
カルボキシメチルセルロースナトリウム	2.5	2.5	2.5
カラギーナン	0.3	0.3	0.3
85%グリセリン	20	20	20
60%ソルビット	20	20	20
甘味剤	0.18	0.18	0.18
ラウリル硫酸ナトリウム	1.5	1.5	1.5
香料	1.0	1.0	1.0
1,2-エポキシ-d-リモネン	0	0.5	0
2-オクタノン	0.8	0	0
防腐剤	微量	微量	微量
水	残	残	残
計	100.0%	100.0%	100.0%

第 4 表

	本発明歯磨 剤No. 1		本発明歯磨 剤No. 2		比較歯磨 剤No. 3	
	2週間後	4週間後	2週間後	4週間後	2週間後	4週間後
パネル 1	17	34	18	32	53	130
2	10	24	11	24	52	122
3	10	12	8	14	44	63
4	5	8	6	7	12	24
平均	11.8	19.5	10.8	19.3	40.3	84.8

From the result of the 4th table, the knowledge of this invention toothbrushing containing 1,2-epoxy-d-limonene with 2-octanone with eight total carbon or ten total carbon having the large stain adhesion inhibition effect compared with comparison toothbrushing is carried out.

Although an example is given and this invention is explained concretely hereafter, this invention is not limited to the following example.

In the following examples, each % is weight %.

[Example 1]

Gear tooth \*\* calcium hydrogen phosphate and 2 hydrate 45.0% glycerin 10.0 sorbitol 25.0 carboxymethylcellulose-sodium 0.5 veegum 0.2 carrageenan 0.3 saccharin-sodium . 0.2 sodium-lauryl-sulfate 1.2 vitamin-E acetate [ ] -- 0.1 perfume 1.0 2-octanone or 1,2-epoxy octane 0.5 antiseptic -- fine -- Water measurement remaining total [ ] -- 100.0% [Example 2]

Gear tooth \*\* calcium hydrogen phosphate and 2 hydrate 10.0% propylene glycol 2.0 sorbitol 20.0 carboxymethylcellulose-sodium 1.4 saccharin-sodium 0.1 sodium-lauryl-sulfate . 1.5 alpha-alumina anhydride 3.0 colloidal silica [ ] -- 3.0 perfume 0.6 2-nonanone or 1,2-epoxy-2-phenylpropane 0.4 antiseptic fine -- Water measurement remaining total [ ] -- 100.0% [Example 3]

Gear tooth \*\*\*\*\* aluminium hydroxide 18.0%. Propylene glycol 2.0 Glycerin . 25.0 Hydroxy ethyl cellulose . 1.2 Saccharin sodium 0.1 sodium-lauryl-sulfate 0.5 lauroyl diethanolamide 0.8 colloidal silica 3.0 perfume 1.0 3-octanone or styrene oxide 0.2 sodium-monofluorophosphate . 0.76 Chlorhexidine glyconate 0.1 antiseptic Minute amount water Remaining total 100.0% [Example 4]

Gear tooth \*\* JIRUKONO silicate 10.0% alumina . 20.0 Propylene glycol 5.0. Glycerin 20.0 Veegum 1.0. Carboxyvinyl polymer 0.2 Saccharin sodium . 0.06 Stevioside 0.01 potassium glycyrrhizate 1.0 sodium-lauryl-sulfate 1.0 tranexamic-acid 0.05 colloidal-silica 2.0 antiseptic Minute amount Perfume 1.0 water Remaining total 100.0% [Example 5]

Mouth wash ethanol 5.0% saccharin sodium . 0.05 sodium-monofluorophosphate 0.05 chlorhexidine glyconate 0.005 lauryl diethanolamide 0.4 coloring matter Optimum dose Antiseptic \*\* antioxidant \*\* perfume 1.0 2-methyl-4-heptanone or pinene epoxide 1.0 water remaining total 100.0% [Example 6]

Troches gum arabic 6.0% grape sugar . 71.0 Gelatin 4.0 Perfume 0.2 dextranase 0.1 chlorhexidine glyconate 0.01 spearmint oil 0.15 sodium-ascorbate 0.1 2-octanone or 1,2-epoxy-d-limonene 1.5 water Remaining total 100.0% [Example 7]

Chewing gum gum base 40.0% calcium pyrophosphate 2.0 water candy 15.0 powdered sugar 40.0 peppermint-oil 0.2 2-decanone or pinene epoxide 0.5 dextranase 0.1 water remaining total 100.0%

## CLAIMS

(57) [Claim(s)]

[Claim 1] 1,2-octanone, 2-nonanone, 2-decanone, 2-methyl-4-heptane, A constituent for the mouths blending one sort chosen from 1,2-epoxy octane, styrene oxide, 1,2-epoxy-2-phenylpropane, a 1,2-epoxy decane, pinene epoxide, and 1,2-epoxy-d-limonene, or two sorts or more.

[Translation done.]